Issue 48 2004

Child Care Information Center NEWSLETTER

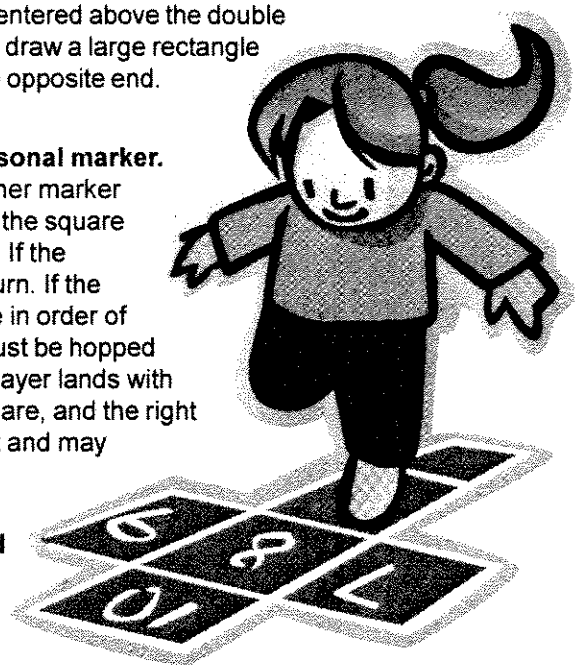
Playful Math

With **Child Care Connections**

~ A newsletter within a newsletter

Hopscotch

Draw a game grid or "court" with chalk on the sidewalk, driveway, or playground asphalt, or with a stick in the dirt. Start by drawing three connecting squares, one above the other. Number the squares "1","2","3". Above the third square, draw two squares, the same size as the others, side by side. Number them "4" and "5". Draw another square centered above the double squares. Number this square "6". Above the sixth square, draw a large rectangle or semi-circle marked "REST". The game begins from the opposite end.



Each player chooses a stone or stick to use as a personal marker. Standing in front of square "1", the first player tosses his/her marker into square one. The marker must land completely within the square and without touching a line or bouncing out of the square. If the marker lands in the wrong square, the player loses that turn. If the toss is successful, the player hops from square to square in order of numbering from 1 to 6 and then REST. Single squares must be hopped on with one foot only. On the side-by-side squares, the player lands with both feet down at once, the left foot landing in the left square, and the right foot landing in the right square. "REST" is a neutral spot and may be landed on in any way the player chooses.

When a player reaches "REST", he/she turns around and hops back through the court, moving through the squares in reverse order, from 6 to 1, and stopping to pick up his/her marker on the way back. This means balancing on one foot while picking up the marker in the same square. If while hopping through the court in either direction, the player steps on a line or marker, misses a square, or loses his balance, his turn ends. If he loses his balance while picking up the marker, he loses his turn and must repeat that round on his next turn. After finishing the round, the player continues his turn by tossing his marker into square number two, and hopping around the court again.

The first player to move a marker through every numbered square and hop through the court wins the game.

Variations:

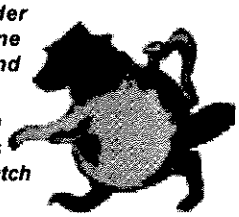
☺ Lengthen the court by adding squares, double squares or triple squares horizontally.

☺ Jumble the placement of the numbers so that players need to hop forward and backward on the court.

☺ This is a two-part game for thre or more players. One player is the judge. Each of the other players gets two markers to begin with. As they get their turns, players toss their markers into the squares of their choice, one at a time. The judge calls out "add" or "subtract". The player whose turn it is adds the numbers or subtracts the smaller number from the larger one. The judge decides if the sum is correct. If it is incorrect, the player loses his turn. If it is correct, the player may move a third marker in the usual hopscotch manner, starting with square "1", jumping through the court and back. The first player to move his third marker through the court wins.

The Child Care Information Center is a mail-order lending library and information service for anyone in Wisconsin working in the field of child care and early childhood education.

Sponsored by the Child Care Section, Wisconsin Department of Workforce Development, CCIC has worked since 1986 to provide quality resources to match the needs of caregivers and parents.



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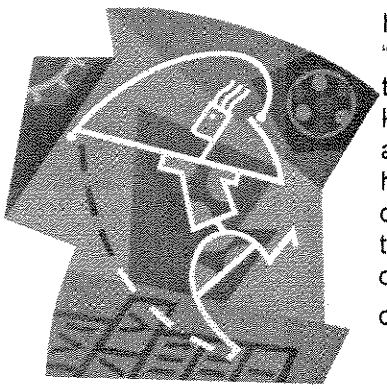
Librarian, circulation: Linda Bather
Mail distribution: Sonia Frank

Playing is Learning

"When I am 7, Maria will be 9. And when I'm 8, she'll be 10. When I am 7, Pappa will be 40. And when I am 8, he will be 41."

He was six-years-old and doing equations in his head. He had discovered a pattern and was enjoying proving it. Math for preschoolers is the discovery of patterns and symmetry, and then manipulating elements to test the pattern. They make their own games by sorting, arranging from smallest to largest, youngest to oldest, inside and outside, and on and on, repeating and adjusting through their play. Math is fun because it is a game. It is part of the child's continuous job of exploring how the world works... the rules, the language, beginnings, endings and the middle...and gaining control.

As with much of the learning taking place in children's early years, our job in supporting children's math learning is to get out of the way. If we listen too little to the questions and emerging logic that comes naturally to children, we are in their way. If we listen but then take over the answer, we are in their way. If we turn discovery into drill, we are in their way.



Early math learning is not only number learning. A vital part of learning support that is a caregivers' job is to start "I wonder ..." and "What if..." conversations. Children seldom pass up an invitation to imagine. A clever caregiver can arrange environments that lead toward understanding and triumphant learning in children.

Recently, I played chess for the first time. My instructor was a first-grader. He patiently explained how each chess piece was allowed to move, waited for me to make my choices, and then gleefully trounced me, piece by pathetic piece. When we participate with children in their exploration, learning becomes much more fun- especially when they can teach us!

One school principal in Milwaukee shed his title and instead called himself "Head Learner". The message that sent to adults and kids alike was that we keep discovering; no matter how old we are, we are never done learning. Perhaps if we are very good at playing with children, we can add to our long list of titles, such as, teachers, providers, caregivers, educarers...the even more challenging title of *head learner*?

—Lita Kate Haddal, editor

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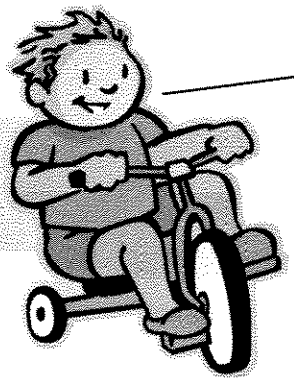
Math Handbook for Preschoolers



by Judith Ecker
Librarian
Deforest Area Public Library

Please Excuse My Dear Aunt Sally (by Judy Ecker and Jan Berg) is the name of the Pre-Math concepts handbook for librarians. The title is a mnemonic for Parenthesis, Exponent, Multiplication, Division, Addition and Subtraction, which is the order in which math problems are performed.

This elaborate title belies the simplicity of the material it contains. The Xerox able activities are suitable for very young children.

The handbook is the product of a grant from the Madison Community Foundation.

I had been working in and around family literacy for a very long time and the real barrier for low literacy patrons was often math as well as reading. As I examined how well American children perform in math testing it became clear that all aspects of communities needed to get involved in providing more support for math learning.

Previously, Jan Berg the Library Director and I had created manuals for use by children's librarians and in family literacy projects based on nursery rhymes, children's literature and more advanced activities for families to do together. So the work required to create the handbook was well understood but we did it anyway. Parallel with the math book project we also created a manual for story times, suggesting activities that were more sensory and gross motor in nature, rather than the traditional "sit and get" model.

My original concept for the math book was simply to think of 50 simple concepts and think of how to make them more sensory or large muscle in nature. As I had conversations with Diana Kasbaum, math consultant from DPI and Kathy Raschke, child care instructor from the Madison Area Technical College, it became clear that a precise order of concepts needed to be used. Surprisingly for us math phobics, numeracy came last. With their direction and assistance I was able to lay out a manual that would cycle appropriately through the concepts most needed by very young children to begin to think in a more mathematical manner.

If it is the intent of the user to create kits to send home with families, the activities should perhaps be redone, with additional information for the parents to use.

Please feel free to modify any of the pages that you copy. If you have additional questions or concerns call : Judy Ecker 608-846-5482.

Books for Free

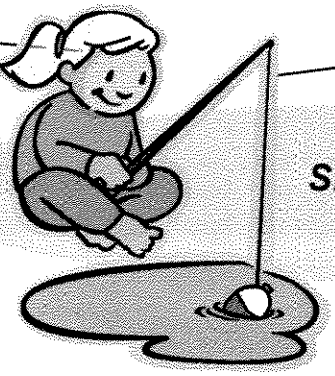
Free books are available to educators to give to their students! The books are free. Educators need only pay shipping and handling.

The Literacy Empowerment Foundation, a 501(c)3 nonprofit organization, is distributing books through the "Books from Bruce" Program. Bruce Larkin, the author of over three hundred children's books, has generously offered to donate to every kindergarten, first grade and second grade child in the United States a book to call his or her own.
To obtain the "Books from Bruce" order form, go to:
http://www.lefbooks.org/

Literacy Empowerment Foundation
6323 Salem Park Circle
Mechanicsburg, Pa 17050
Phone: 610-719-6448
Web site: http://lefbooks.org
E-mail: rorendi@literacyempowerment.org

News & Views

How are Children in Foster Homes Faring?



Significant Problems and Some Strengths Exist

From *Child Trends*
Washington, DC

Beyond the tragic cases that reach the news, what do we know about the health and well-being of children in foster homes? By reviewing the best data available, Child Trends found that generally this population is in poorer health than other children, they have more developmental and behavioral problems, and many are poorly engaged in school. But, on the positive side, nearly all foster children had health insurance, many had strong relationships with at least one adult, and more than half attended religious services regularly.

"By better understanding the strengths and challenges faced by children in the foster care system and the diversity among them, caregivers and those working in the child welfare system can better focus resources on critical areas of need," said Kristin Moore, president and senior scholar at Child Trends.

The data in the brief, Children in Foster Homes: How Are They Faring?, come from two sources: the National Survey of Child and Adolescent Well-being and the National Survey of America's Families. Some of the findings include:

- Twenty-four percent of children under age 15 in foster care have chronic health problems; almost one-third (30 percent) have a disability.
- Nearly all children in foster care (95 percent) are covered by public or private health insurance; ninety percent of those under 5 were up-to-date on their immunizations.
- A small minority of 11- to 14-year-old foster care children reported smoking (1 percent), drinking (8 percent) or using other drugs (7 percent) in the last month.
- Nearly half of foster children have a clinical level of behavioral or emotional problems (47 percent of 6- to 11-year-olds and 40 percent of 12- to 14-year-olds). They are about four times as likely to have a high level of problems compared to other children.
- Young children in foster care (ages 2 months to 2 years) show troubling signs of developmental problems. Nearly 60 percent of these children can be described as at high risk for a clinical level of impairment; only nine percent are at low risk.
- School-age children in foster care are about twice as likely as other children to be poorly engaged in school (39 percent versus 18 percent).
- Most children in foster care report having a positive relationship with their caregiver or another adult (76 percent said they feel "quite a bit" or "very close" to their caregiver, and 97 percent said they had a trusted adult they could turn to for help).

The brief also provides a set of potential policy suggestions that include more support and training for foster parents and better service integration for parents and children.

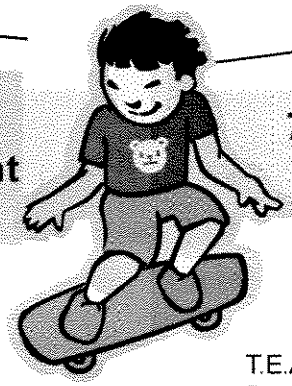
Child Trends, founded in 1979, is an independent, nonpartisan research center dedicated to improving the lives of children and their families by conducting research and providing science-based information to the public and decision-makers.

The entire research brief is available at:
http://www.childtrends.org/files/FosterHomesRB.pdf

For more information contact Amber Moore, Child Trends, 4301 Connecticut Avenue, NW, Suite 100, Washington, DC 20008202-572-6134.
E-mail: amoore@childtrends.org

News & Views

Achieving Your Professional Development Goals:



T.E.A.C.H. Scholarships Can Help!

by Peggy Haack
WECA, Outreach Coordinator
T.E.A.C.H. Early Childhood® WISCONSIN

Working with young children, you touch the future, so today give them your best! Consider taking the next step in your professional development with credit-based education. The T.E.A.C.H. Early Childhood® WISCONSIN Scholarship Program can help you earn a credential (the Infant-Toddler or Administrator's Professional Credential) or put you on a path to earn a degree (Associate's, Bachelor's or even Master's degree) *while you're working.*

Check below to see if a T.E.A.C.H. Scholarship may be right for you:

- ☐ Do you work 25 hours a week or more in a regulated child care center, Head Start program, school-age or family child care program as a teacher, teacher assistant, director, or family child care provider?
- ☐ Could you use help paying for the cost of tuition, books, travel, and release time from your job to study or go to class?
- ☐ Is your program supportive of efforts to improve professional qualifications?
- ☐ Would you agree to continue employment in your current program for 6 months to a year if they agree to sponsor you as a scholarship recipient?
- ☐ Do you believe your efforts would be worthy of a financial bonus from T.E.A.C.H. and a bonus or raise from your center at the end of a scholarship contract?

Still interested? Now is the time to plan for spring semester classes, and we have money to give away! The Scholarship Program is alive and well, and we welcome new applicants.
Contact us for additional information and application materials:

T.E.A.C.H. Early Childhood® WISCONSIN
Phone: 608-240-9880, ext. 7240 or 800-783-9322, ext. 7240
E-mail: teach@wecanaeyc.org
Or check our website www.wecanaeyc.org

T.E.A.C.H. Early Childhood® WISCONSIN is a nationally licensed scholarship program administered by the Wisconsin Early Childhood Association. The goals are to increase education, increase compensation and reduce turnover in the early childhood education field by working in partnership with scholarship recipients and sponsoring programs.

T-Net Goes Live

Peter Deakman, Systems Development, The Registry, Wisconsin's Recognition System for the Childhood Care and Education Profession

The Wisconsin Training Network has moved. Our new address: www.t-net.org

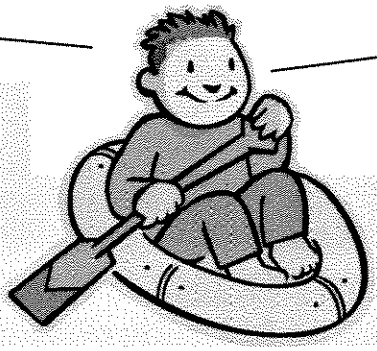
Easier to say, easier to type, easier to use. Please come try it out, including some of our new bells and whistles including:

1) A shopping cart to print, email and share training items of interest to you
2) Enhanced sponsor entry of training events including: Easier forms directed to specific training and the ability to keep and submit attendance for State Entry Level and Registry CEU training.

See you on the web!

News & Views

Redesigning Teacher Training & Professional Development



Wisconsin Quality Educator Initiative Chapter PI 34

by Julia Herwig, UW Waisman Center
Early Childhood Professional Development

Competency based

PI 34 is the user term for a new design for teacher training in Wisconsin. It refers to Chapter PI 34 of the Wisconsin Administrative Code and the Wisconsin's Quality Educator Initiative. PI 34 is designed to build teacher training programs and ongoing professional development opportunities that are competency based and consistent with the Department of Public Instruction state teacher standards. In this competency based system, students in teacher training programs are asked to demonstrate knowledge, skills, and attitudes for teaching young children. Upon graduation from a 4-year institution, initial licenses are issued only to prospective educators that perform successfully, as measured by the standards.

Assuring ongoing quality

PI 34 will require that all licensed teachers graduating after August 2004 participate in a system of professional development to move from the licensed category of Initial Educator to Professional Educator. Following graduation, Initial Educators will participate in a professional development system that includes a qualified mentor, a professional development team, and a professional development plan. Educators will have 5 years to complete this process and demonstrate competence for the Professional Educator license.

Who is impacted?

PI 34 will apply to all licensed teachers including those employed by school districts, child care and Head Start.

Implementation of PI 34 will affect all systems that support early childhood programs for example,

1) **All early childhood licensed teachers hired by school programs must have access to early childhood-specific professional development activities to maintain their licenses**. Under PI 34, the school district is responsible for ongoing orientation, support seminars, and providing a qualified mentor.

2) **Early childhood licensed teachers hired by non-school programs must have access to early childhood-specific professional development activities to maintain their licenses.** Teachers working in Head Start and child care may have DPI licenses. Teachers in both of these settings need access to professional development and qualified mentors required by PI 34 to maintain their licenses and to ensure that these settings continue to be employment opportunities for licensed teachers. PI 34 does not specify responsibility for providing ongoing orientation, support seminars, and qualified mentors outside the public school setting.

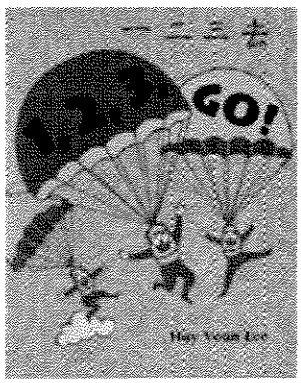
The Department of Public Instruction (DPI) is working in partnership with representatives from other state departments to develop an implementation plan that meets the diverse needs of early childhood education and child care professionals who are working outside of school systems. Further information about PI 34 is available on the web at:
http://www.dpi.state.wi.us/dpi/dlsis/tel/index.html
and will also be featured in upcoming CCIC Newsletters.

Books Count!
Number Fun for Young Children

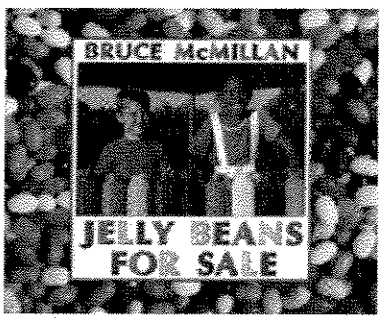
Compiled by Merri V. Lindgren / Cooperative Children's Book Center
School of Education / University of Wisconsin-Madison

Visit your local public library to borrow these books. If they are not available at your local library, you may request them through interlibrary loan service.

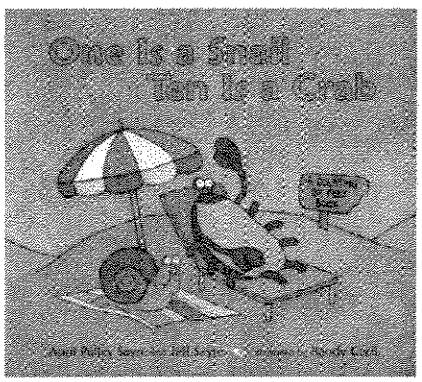
Ready, Set, Count:



- **1, 2, 3, Go!** by Huy Vuon Lee. Henry Holt, 2000. 32 pages. Ages 3-7.
- **Cock-a-Doodle-Doo: A Farmyard Counting Book** by Steve Lavis. U.S. edition: Lodestar/Dutton, 1997. 28 pages. Ages 1-3.
- **Count!** by Denise Fleming. Henry Holt, 1992. 32 pages. Ages 2-6.
- **Fish Eyes: A Book You Can Count On** by Lois Ehlert.. Harcourt Brace Jovanovich, 1990. 32 pages. Ages 2-6.

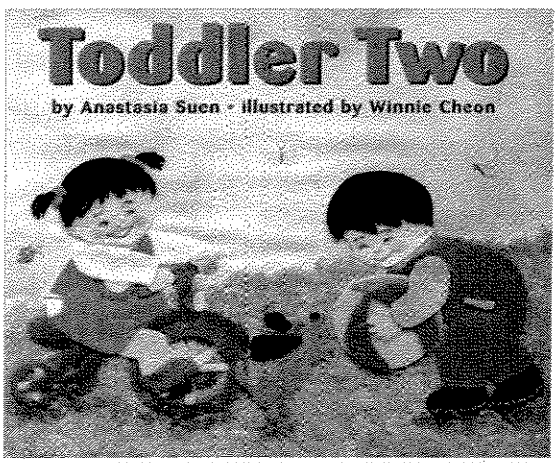


- **Jelly Beans for Sale** by Bruce McMillan. Scholastic, 1996. 32 pages. Ages 3-8.



- **One Gorilla: A Counting Book** by Atsuko Morozumi. U.S. edition: Farrar, Straus & Giroux, 1990. 24 pages. Ages 2-4.
- **One Is a Snail, Ten Is a Crab: A Counting by Feet Book** by April Pulley Sayre and Jeff Sayre. Illustrated by Randy Cecil. Candlewick Press, 2003. 36 pages. Ages 4-9.

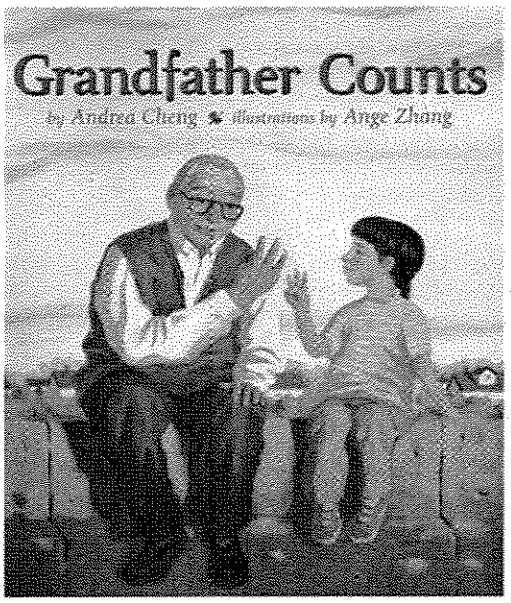
- **Ten Puppies** by Lynn Reiser. Greenwillow Books / HarperCollins, 2003. 32 pages. Ages 3-6.



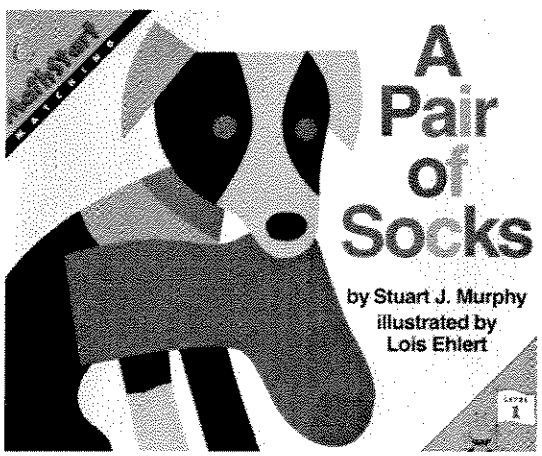
- **Toddler Two / Dos Años** by Anastasia Suen. Illustrated by Winnie Cheon. Lee & Low, 2002. 16 pages. Ages 1-3.
- **Uno, Dos, Tres: One, Two, Three** by Pat Mora. Illustrated by Barbara Lavallee. Clarion, 1996. 43 pages. Ages 3-6.

Math All Around:

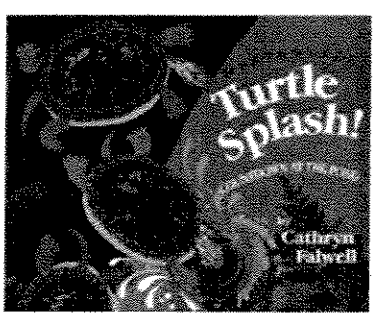
- **Counting Cranes** by Mary Beth Owens. Little, Brown, 1993. 32 pages. Ages 3-7.
- **Counting on the Woods** by George Ella Lyon. Photographs by Ann W. Olson. A Richard Jackson Book / DK Ink, 1998. 32 pages. Ages 4-8.



- **Five Creatures** by Emily Jenkins. Illustrated by Tomek Bogacki. Frances Foster Books / Farrar, Straus and Giroux, 2001. 24 pages. Ages 3-6.
- **Grandfather Counts** by Andrea Cheng. Illustrated by Ange Zhang. Lee & Low, 2000. 32 pages. Ages 4-8.
- **Just a Minute: A Trickster Tale and Counting Book** by Yuyi Morales. Chronicle, 2003. 28 pages. Ages 4-7.
- **Millions of Snowflakes** by Mary McKenna Siddals. Illustrated by Elizabeth Sayles. Clarion, 1998. 25 pages. Ages 18 months – 3 years.



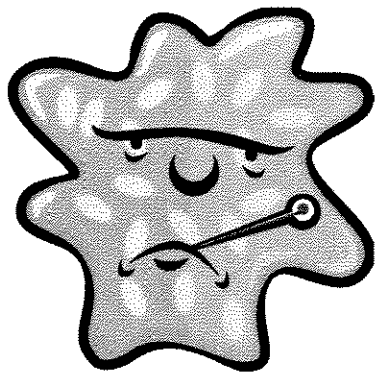
- **My Baby Brother Has Ten Tiny Toes** by Laura Leuck. Illustrated by Clara Vulliamy. Albert Whitman, 1997. 24 pages. Ages 1-3.
- **One Duck Stuck** by Phyllis Root. Illustrated by Jane Chapman. Candlewick Press, 1998. 32 pages. Ages 2-5.
- **A Pair of Socks** by Stuart J. Murphy. Illustrated by Lois Ehlert. (Math Start) HarperCollins, 1996. 33 pages. Ages 4-6.
- **Turtle Splash! Countdown at the Pond** by Cathryn Falwell. Greenwillow Books / HarperCollins, 2001. 32 pages. Ages 3-6.



To read brief descriptions of the books listed above, visit the CCBC website at www.education.wisc.edu/ccbc/bibs/numbers.htm

Pertussis (Whooping Cough) and Day Care Centers in Wisconsin

The Wisconsin Immunization Program, in the Department of Health and Family Services, wants to alert all day care center operators that a major outbreak of pertussis (or whooping cough) is occurring in Wisconsin and tell you what day care operators should do. To date over 1,700 cases have been reported from 53 counties in Wisconsin. This is approximately 8 times higher than what is reported in a typical year.



Signs and symptoms of pertussis

Pertussis is a bacterial disease that is spread through the air by direct face to face contact with a case of pertussis. Pertussis begins with cold like symptoms and a cough that becomes much worse over a period of 1-2 weeks. Symptoms usually include a long series of coughs ("coughing fits") followed by a whooping noise as the person struggles to inhale air. However, older children, adults and very young infants may not develop the whoop. There is generally no fever. People with pertussis may have a series of coughs followed by vomiting, turning blue, or difficulty catching their breath. The cough is often worse at night and cough medicines usually do not help reduce the cough.

DTaP Vaccine

Pertussis is most serious in infants and preschoolers who are behind schedule or have not received any DTaP vaccine. Please make sure children in your center are up to date with the required doses of DTaP vaccine. DTaP vaccine is only licensed for children ages of 2 months through 6 years of age. The protection from the vaccine can decrease over time leaving some older children and adult staff unprotected.

What you should do if a child in your center has pertussis

Report the illness to your local health department immediately. Health department staff will assist with follow up and taking the steps necessary to prevent disease in exposed children and staff.

A child or staff member with known or suspected pertussis must be kept home until that child or staff member has received at least 5 days of antibiotic treatment. The antibiotic treatment will make the person non-contagious and therefore allow him or her to return to day care after the 5 days of treatment. However, the symptoms of pertussis may still be present after the completion of the course of treatment. Day care center operators should be careful in screening new enrollees and walk-ins and not accept those that may be symptomatic with pertussis.

More information

For more information please contact your local health department or the Wisconsin Immunization Program website at http://dhfs.wisconsin.gov/immunization/pertussis2.htm

Advance notice to parents about sending a sick child to day care

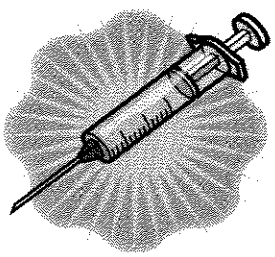
December 2004

Dear Parent:

Reported cases of pertussis (or whooping cough) have increased in Wisconsin among children of all ages this summer. It is important that you not send your child to day care if he or she has any of the signs or symptoms of pertussis listed below. Sick children with pertussis will not be allowed in the day care center. Children with suspected pertussis should be tested, treated with appropriate antibiotics and isolated until at least 5 days of antibiotic treatment have been completed. All suspected and confirmed cases of pertussis need to be immediately reported to your local health department.

Pertussis is a bacterial disease that is spread through the air by direct face to face contact with a case of pertussis. Pertussis begins with cold like symptoms and a cough that becomes much worse over a period of 1-2 weeks. Symptoms usually include a long series of coughs ("coughing fits") followed by a whooping noise. However, older children, adults and very young infants may not develop the whoop. There is generally no fever. People with pertussis may have a series of coughs followed by vomiting, turning blue, or difficulty catching breath. The cough is often worse at night and cough medicines usually do not help reduce the cough.

Pertussis is most serious in infants and preschoolers who have not received DTaP vaccine. DTaP (Diphtheria, Tetanus and acellular Pertussis) vaccine is only licensed for children ages of 2 months through 6 years of age. Make sure your child is up to date with DTaP immunizations. The recommended schedule for DTaP vaccine is a dose at 2 months, 4 months, 6 months, and 15-18 months and a booster dose at school entrance (4-6 years).



Please contact your doctor or local public health department if you have any questions.

Thank you for your cooperation.

Information from the Wisconsin Immunization Program, Department of Health and Family Services

Preventing the Spread of Influenza in a Day Care Setting

How You Can Help

Wisconsin Department of Health and Family Services

Influenza, or the "flu" is spread mainly from person to person when people cough or sneeze near one another. Sometimes it can be spread when a person touches nose drainage or saliva from an infected person and then touches one's own mouth or nose before washing hands.

The best way to prevent serious illness from influenza is to get immunized. Normally we would encourage all persons over the age of 6 months to receive the "flu shot". But this year there is a shortage of the vaccine, and only persons at high risk for complications of flu will be able to get immunized. Therefore it is especially important this year to follow the guidelines below, to help protect yourself, your co-workers, and your family from getting the flu. For more information, visit: http://dhfs.wisconsin.gov/communicable/influenza

Immunization **People in the following categories should be immunized:**	**1. Aged 6-23 months.** **2. Children with chronic medical conditions.*** **3. Children 6 months and older who are on chronic aspirin therapy.**	**4. Children aged 2 and older who are household contacts of infants under 6 months of age.** **5. Day care providers of children less than 6 months old should be immunized.**	**6. Day care providers who are pregnant during the influenza season should be immunized.**
Respiratory Hygiene **Children and care providers should practice good cough etiquette / respiratory hygiene**	**1. Cover nose and mouth with a tissue when coughing or sneezing.** **2. Throw the tissue into a waste container immediately after use.** **3. Wash hands with soap and water immediately after discarding tissue.**	**Care providers should assist young children in following cough etiquette when necessary.** **Care providers who clean children's noses and mouths with tissue should wash hands immediately after discarding tissue.**	**Supplies of tissues and waste containers should be available in convenient locations in the facility.** **Children should not be allowed to share drinking cups or eating utensils.**
Hand Hygiene **Make sure sink areas have plenty of soap and paper towels available for use.**	**To help protect against respiratory illnesses, care providers should wash hands:** **1. as a part of respiratory hygiene.** **2. between contacts with infants and children, as much as possible.** **3. before serving meals or infant feedings.** **4. after touching objects soiled with nasal or oral secretions.** **5. whenever hands become soiled.**	**Care providers should instruct children to wash hands and assist them when necessary:** **1. as a part of respiratory hygiene.** **2. after touching items contaminated with nasal or oral secretions.** **3. before eating meals.** **4. whenever hands become soiled.**	**Hands should be washed with warm soap and water for at least 15 seconds with rubbing action, then rinsed, and dried with a paper towel. A clean paper towel should be used to turn off water faucets.**
Exclusion	**Children should be observed for symptoms of respiratory illness.**	**Those who develop fever (100° F. or higher), chills, cough, sore throat, headache, or muscle aches should be sent home as soon as possible.**	**Symptomatic children should be removed to a separate area until they can be taken home. Children with influenza should stay at home for least 7 days after onset of symptoms.**

* People with chronic medical conditions include those who have required regular medical follow-up or hospitalization during the preceding year because of chronic metabolic diseases (including diabetes mellitus), renal dysfunction, hemoglobinopathies, or immunosuppression (including immunosuppression caused by medications or by human immunodeficiency virus [HIV]). For additional guidance on chronic conditions, see letter from Dr. Jeffrey P. Davis, chief medical officer and state epidemiologist for the Bureau of Communicable Diseases and Preparedness, to health care providers (available on the DHFS website at http://dhfs.wisconsin.gov/communicable/influenza/interim2004.htm. Click on "Further Clarification of Priority Populations").

UNIVERSITY OF WISCONSIN - EXTENSION

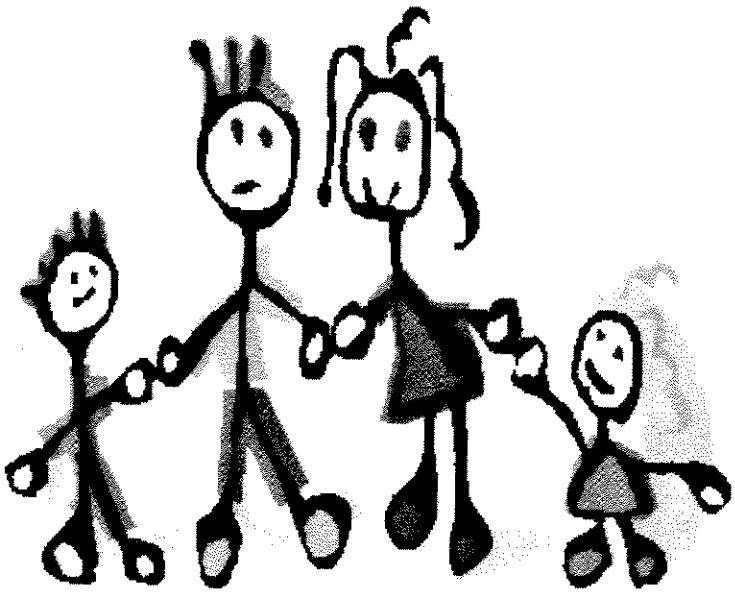
CHILD CARE CONNECTIONS

Volume 48 2004

National Network for Child Care

How Children Learn Math, And How We Help Them

Dr. Dave Riley & Mary Breidenbach, University of Wisconsin-Extension



Teacher Heidi notices that Damon and Jack are anxious to help her pack the lunch for their picnic at the park. "Let's see," she says. "How many paper plates and cups do we need to take?" She points to the names on the bulletin board and asks, "How many children are here today?" Damon touches each name as he counts the number. "Eight!" he shouts. "Okay," Heidi says, "We also need plates and cups for the teachers. So, if we have eight children and two teachers, how many plates do we need?" She looks to Jack while holding up her fingers for him to count. He counts her fingers and shouts out, "Ten!" with a smile. "You're right! Jack, you can count out ten plates, and Damon you can count out ten cups and put them in our picnic basket."

Like Damon and Jack, most young children are proud and eager to demonstrate their knowledge of numbers. Creative early childhood teachers like Heidi can find opportunities throughout the day for children to learn about numbers and other mathematical concepts. Heidi is very skilled at this. With her prodding, the two boys work on the logic of one-to-one correspondence (name to number, and plates to cups) and simple addition.

Babies come equipped to understand "more" and "less." Children as young as two can sometimes count from 1 to 20, but they seldom understand the concept of number yet. This is like the child who can recite the alphabet song, but cannot identify a letter or its sound.

On average, 3-year-olds can count to 12 and 4-year-olds can often count to 40.[1] How do children learn to do this? Besides learning number words, preschoolers need to understand three principles before they can accurately count: **the principles of**

- **one-to-one correspondence**,
- **stable order**,
- **cardinality**.[2] (Endnotes)

See the following table for examples.

Table 1: Explanations and examples of the three counting principles

Counting Principle:	Explanation:	Example:
One-to-one correspondence principle	*Each object should be labeled with only one number, so that no object is missed and the same object is not counted twice.*	If counting two trucks, the red truck is labeled "1" and the blue truck is labeled "2." The red truck cannot be relabeled "3."
Stable order principle	*The same sequence of numbers must be used to label objects each time they are counted.*	If counting 4 blocks, the number sequence must be "1," "2," "3," "4," NOT "1," "4," "3," "2," or "1," "2," "5," "6."
	The number that is said last represents the number of objects	

Three to four-year-olds are just beginning to learn these three counting principles. Even though children often make mistakes when counting at this age, research shows that children often can identify another person's counting errors. For example, one research study examined whether children would be able to catch a puppet's counting mistakes when the puppet violated one of these principles.[3]

Most 3 and 4-year-olds were able catch the puppet's violation of the **one-to-one correspondence principle**. That is, when the puppet skipped one of the objects or counted one of the objects twice, most children said that the puppet's counting was wrong. (**TEACHING TIP**: Try this and the other mistakes yourself, with a puppet at circle time. Children love to catch you or the puppet making a mistake, and they will learn from each other!)

Most 3, 4, and 5-year-olds also said the puppet's counting was wrong if the puppet reversed the order of two numbers when counting or used a random sequence of numbers when counting, both violations of **the stable order principle**. However, 3-year-olds seldom caught the puppet skipping numbers when counting (e.g. 1, 2, 5, 6.) Skipping numbers is a common counting mistake among 3 year olds.

Finally, almost all of the 3 and 4-year-olds knew when a puppet's final answer of the number of objects that had been counted was right or wrong. When the puppet violated **the cardinality principle** by stating that the number was one more (or less) than had been counted, children almost always said the puppet's answer was wrong. Therefore, this research shows that by 3 to 4 years old, children are learning the counting principles, even though they may continue to make counting mistakes (especially when counting larger numbers of objects).

Use a puppet to try these experiments yourself. The children will love it!

[1] Murray, P. L. & Mayer, R. E. (1988). Preschool children's judgments of number magnitude. *Journal of Educational Psychology, 80(2)*: 206-209.

[2] Gelman, R. & Gallistel, C. (1978). *The Child's Understanding of Number*. Cambridge, MA: Harvard University Press.

You may be teaching math without even realizing it!

When you read children the Goldilocks story, you are teaching a math lesson about size relationships (the mother bear's bowl was smaller than papa bear's, but larger than baby bear's), order and seriation. That is one reason why young children love the story: they are wrestling to understand these very concepts in their logical thinking.

Try playing the "classification" game with toddlers. Pour out a pile of objects (like blocks of different sizes, shapes, and colors) and ask the child to "put together things that are alike." Then watch what the child does, describe it out loud to the child, and ask questions about why objects are in one pile or another. Don't expect children to consistently form classes of objects very well until age 4 or 5.

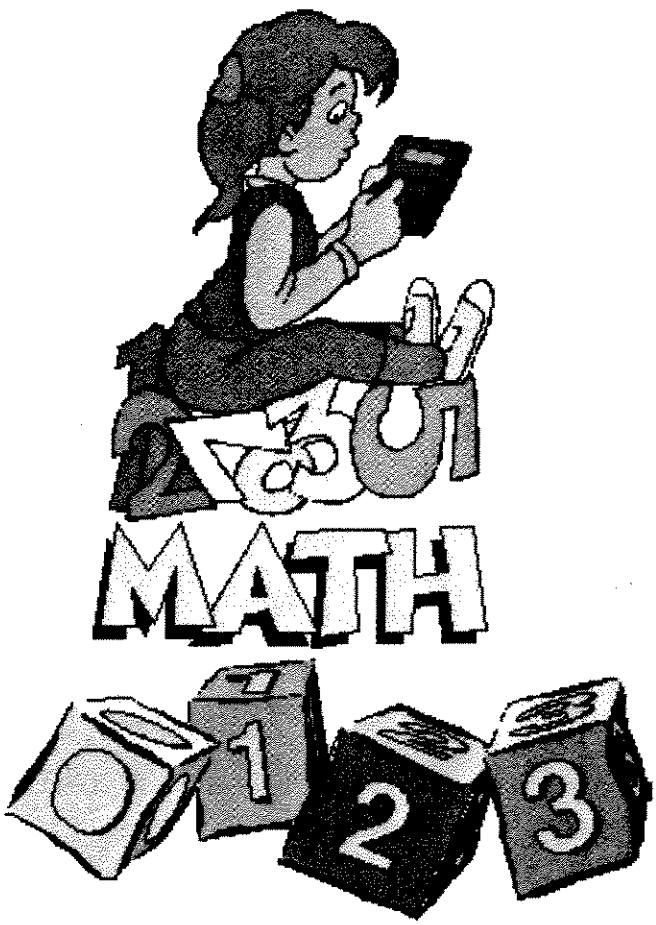
One way to do sorting that most children really enjoy is to use props, like sorting buttons into different jars or a sorting tray. Also try using tongs, tweezers, a spoon or chop sticks for picking up the buttons or blocks.

Music time can be great for learning one-to-one correspondence. Play a short rhythm of a few beats on a drum, for the child to repeat. Musicians refer to this as "call and response." As the child gets better, your "call" can become more complex. The child is creating a one-to-one match to your rhythm. Of course, let the child go first too, and you give the response.

A similar game of call and response can be played with blocks. Take a few blocks and make a simple construction with them, then let the child try to copy it exactly with additional blocks. These are concrete actions that represent one-to-one correspondence, and you will find that children may really enjoy these games, since they are exercising the capabilities they are currently working to develop.

Children also learn one-to-one correspondence when they count while jumping or swinging. Make a rule: 10 (or 20) swings, then it's the next person's turn. Everyone will count out loud!

Number. Children have a difficult time understanding the meaning of larger numbers. You can help them understand, and learn about numbers, by providing a concrete demonstration of number sizes. For example, show them with a measuring tape how old the four-year-olds are: 4 inches. Now show them how old you are with the same measuring tape! You can also use the measuring tape to give children an appreciation of time, such as number of days until a holiday, or number of years since your town was settled.



Observations of Promising Practices from Wisconsin's Early Childhood Centers for Excellence.

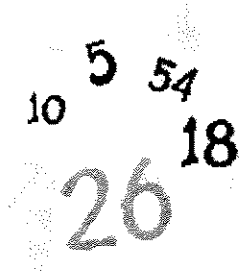
Promising Practice: Teaching Subtraction.

What We Saw:

Elisa wanted to make a pegboard picture just like the one on its box. Teacher Hannah helped her, because the pegs were difficult to push into place. Elisa counted the number of pegs in the picture, "1, 2, 3, 4, 5, 6." Hannah asked "How many are already in the pegboard?" Elisa answered "Four." Hannah held up 6 fingers, saying, "We need six, and we have four. 1, 2, 3, 4" as she put down fingers, leaving two up. "So how many do we still need?" Elisa counted "1, 2 – we need two more." She gave two pegs to Hannah to push into the frame.

What It Means:

A good early childhood setting is rich in opportunities to solve problems, and solving problems is how children create knowledge. Elisa probably could not have solved this problem on her own, but with a little help from her teacher she can. The teacher provides just enough additional, external structure (like using fingers to represent the subtraction problem, and posing the right question) so that Elisa can discover the solution. From this experience, Elisa may need less help next time. That's teaching!



Promising Practice: Math is Everywhere!

What We Saw:

The teacher helped several children in a sorting activity with leaves they had collected on a walk. She helped one child to sort the leaves into two piles of yellow and brown. When another child decided to put her leaves away, the teacher encouraged her to count them as she put them in the bag. Together they counted five. While they were counting they talked about which leaves are big and which are small.

What It Means:

A casual observer could easily miss how much math learning takes place here! It begins with learning to **classify objects into sets** (yellow vs. brown leaves). Then the principle of **one-to-one correspondence** (necessary for a full understanding of numbers) is emphasized by counting along with the child's own actions (putting each leaf in the bag). Finally, distinctions of **quantity** are made (big vs. little). Next time, the teacher may also encourage the children to lay the leaves out from smallest to biggest: that's **seriation**, a step toward an understanding of number quantity.

CHILD CARE CONNECTIONS

Child Care Connections is a publication of the University of Wisconsin-Extension, in cooperation with:

- State of Wisconsin Early Childhood Excellence Initiative
- University of Wisconsin-Madison
- State of Wisconsin Department of Public Instruction (DPI)
- State of Wisconsin Department of Workforce Development (DWD) Child Care Information Center (CCIC)

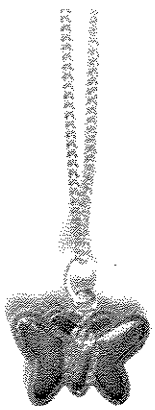
Special thanks to Lita Haddal, CCIC, Department of Workforce Development Child Care Section. For more information contact Deb Zeman at (877) 637-6188

KID'S NEWS

From U. S. Consumer Product Safety Commission

Recall of Metal Toy Jewelry Sold in Vending Machines

In cooperation with the U.S. Consumer Product Safety Commission (CPSC), four toy jewelry importers announced in July, 2004 the voluntary recall of 150 million pieces of toy jewelry sold in vending machines across America. CPSC determined that some of this toy jewelry contains dangerous levels of lead, posing a risk of lead poisoning to children. Because it was difficult to distinguish the lead jewelry from the non-lead jewelry, the industry decided to recall all of it. Young children sometimes mouth or swallow items like these, and lead can leach from the jewelry into the child's body. Lead poisoning in children is associated with behavioral problems, learning disabilities, hearing problems and growth retardation.

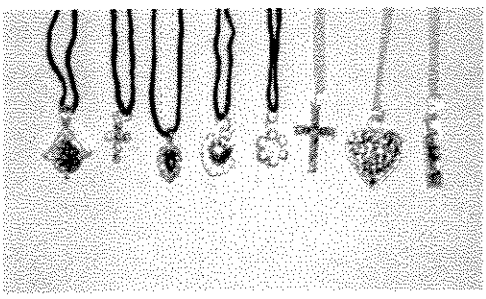


Type of Jewelry

This recall involves various styles of rings, necklaces and bracelets. All of the jewelry was manufactured in India and sold in vending machines located in malls, discount, department and grocery stores nationwide from January 2002 through June 2004 for between $0.25 and $0.75. Photographs of the jewelry involved can be viewed on the July 2004 recall listing at the CPSC website: www.cpsc.gov.

What You Can Do!

CPSC recommends that parents check their children's jewelry for any of these items and throw away any recalled jewelry.



For more information on safety, contact CPSC at (800) 638-2772 or visit their website: www.cpsc.gov.

Items-to-Keep

Selected and annotated by Glenna Carter, CCIC Acquisitions Librarian

Editor's Note: These articles were selected for the basic math concepts they embrace in a reader-friendly way, giving many examples and activity ideas to help caregivers play with math.

1. **Activity-based developmental learning in a collaborative first-grade classroom.** Susan Bolenbaugh. Young Children, July 2000. A first-grade teacher describes the experiential learning activities she uses to teach math to children at several levels, including some with learning disabilities and some with special speech and language needs.

2. **Algebra in the early years? Yes!** Jennifer Taylor-Cox. Young Children, January 2003. How to support young children's exploration of algebraic thinking and pattern recognition from toddlerhood on.

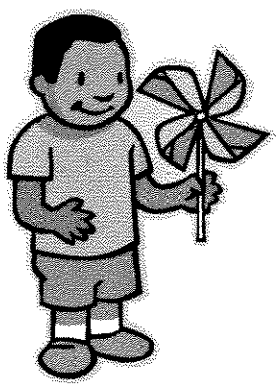
3. **Beginnings workshop: Numbers and math.** Child Care Information Exchange, May-June 2003. Five articles on numbers and math instruction for young children: Math talk with young children: One parent's experience; How children build their understanding of numbers; Early math: It's more than numbers; Assessing mathematical learning: Observing and listening to children; Encouraging rich mathematical experiences at home. Includes tips for teacher training.

4. **Beginnings workshop: Math and numbers, Part 2.** Child Care Information Exchange, July-August 2004. Four articles that share fun, easy to use, meaningful math and number activities that put theory into practice: The history of Mancala in the Garden Room; Line Printing: A process for exploring mathematical concepts; Music and math: How do we make the connection for preschoolers; After-school fun with math: Collections, sorting, and graphing games. Includes tips for teacher training.

5. **Building abstract thinking through math.** Douglas H. Clements and Julie Sarama. Early Childhood Today, March 2004. How to use math activities to teach abstract thinking. Includes a chart on the development of math concepts age by age from birth to 7.

6. **Building numeracy with homemade materials.** Texas Child Care, Fall 1999. Explains that numeracy is the skill that allows us to understand numbers and how they work together to let us solve everyday problems. Suggests activities to help children 3 years and older learn about spatial relationships, classifying, patterns, correspondence, and graphing.

7. **Building numeracy with more homemade materials.** Texas Child Care, Winter 1999. Appropriate math education stimulates children to recognize and understand mathematical relationships in day-to-day situations like the ones suggested here involving ordering, numeral recognition, counting, number sense and numeration.



8. **Building your math program** and **Early childhood mathematics: Promoting good beginnings.** Early Childhood Today, Jan/Feb 2003. Brief instruction sheet and teacher handout for a staff workshop on math learning. Recommendations for a mathematical teaching workshop.

9. **Children are born mathematicians: Creative pathways to math.** Douglas H. Clements. Early Childhood Today, Jan/Feb2003. Nearly half of all episodes of children's natural play observed by researchers included math. This article suggests creative ways to help children develop math concepts from their play. Includes 8 activity plans for children 3-6.

10. **Developing math games based on children's literature.** Kay M. Cutler and others. Young Children, January 2003. How to make simple hands-on math games based on favorite stories for children PreK to grade 2.

11. **Developing mathematical understanding along the yellow brick road.** Phyllis Whitin and David J. Whitin. Young Children, January 2003. An invitation for kindergartners to play Munchkins in a production of *The Wizard of Oz* leads to some unexpected opportunities to teach and learn about math.

12. **Early childhood mathematics: Promoting good beginnings.** NCTM & NAEYC. http://www.naeyc.org/about/positions/pdf/psmath.pdf Recommendations on math education for 3- to 6-year-old children, from the National Association for the Education of Young Children (NAEYC) and the National Council of Teachers of Mathematics (NCTM).

13. **Early math: The next big thing.** Ann S. Epstein. HighScope ReSource, Summer 2003. Children's early math experiences happen without drills and memorization. To develop their understanding of numbers, children need to practice reasoning their way through situations without being challenged for reaching a wrong answer. Questioning children can hinder their thinking. Adults must *listen to how children reason* in order to know whether their math skills are growing on track. This article helps explain the thought processes of children at different stages so that adults may support children's learning in nonintrusive ways.

14. **Family math.** Early Childhood Today, October 2002. Children create drawings of family members and use them for math activities. For mixed ages.

15. **Get ready, get set, go with 10.** Judith McConnell and Kathleen Leon. Texas Child Care, Spring 1998. 15 active learning experiences that use the concept of "10" for 3- to 5-year olds. Includes math, language, music and movement activities, and a list of number books for children.

16. **Group time: Organizing your group – easy as 1, 2, 3!** Ellen Booth Church. Early Childhood Today, October 2003. Suggests quick and easy math games to gather children together for group time, organize turn taking in the group, and then dismiss them for the next activity.

17. **Growing gardens and mathematicians: More books and math for young children.** Hilari A. Hinnant. Young Children, March 1999. A math-using gardening project for children in grades K-2, based on Lois Ehlert's book *Planting a Rainbow.*

18. **Ideas on manipulative math for young children.** Anne Murray. Young Children, July 2001. Children use manipulatives to construct mathematics concepts independently in a kindergarten class where the math center is the most popular area in the room.

19. **Infants and toddlers exploring mathematics.** Eugene Geist. Young Children, January 2003. How the play of infants and toddlers relates to math and what teachers can do to encourage the natural mathematical interests of children this age.

20. **Integrating mathematics for young children through play.** Smita Guha. Young Children, May 2002. Working math into everyday preschool routines and play in learning centers.

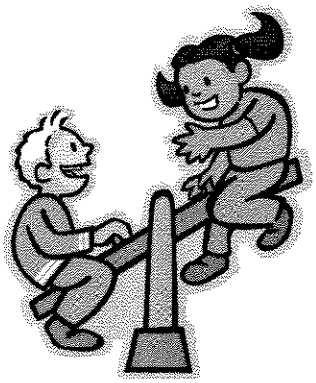
21. **Learning in the block corner.** Jody Martin. Early Childhood News, Jan/Feb 2004. As they compare, measure, count, sort and classify, block play helps children develop logical thought processes, construct physical knowledge about spatial relationships, and sharpen their cognitive skills.

22. **Learning math at home.** Texas Child Care, Winter 1999. This 4-page newsletter for parents gives them lots of ideas on how their children can enjoy using math in everyday home activities.

23. **Learning paths and teaching strategies in early mathematics.** Young Children, January 2003. This handy chart gives typical math knowledge and skills for 3- to 6-year-olds and sample teaching strategies in the following areas: number and operations, geometry and spatial sense, measurement, pattern/algebraic thinking, and displaying and analyzing data.

24. **Math: A civil right.** Douglas H. Clements. Early Childhood Today, Jan/Feb 2003. We need to help children become just as good at math as they are at reading.

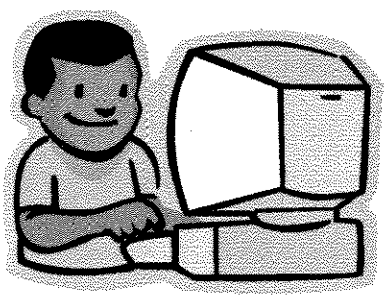
25. **Math counts! : Fun & creative ways to present math concepts to young children.** Shelley Butler. Early Childhood News, Jan/Feb 2004. Activities to promote a healthy math attitude, one that sees that math is all around, it's fun and interesting, and it's something you can do.



26. **Math experiences that count!** Young Children, July 2002. Summarizes the recommendations of a joint position statement of the National Association for the Education of Young Children and the National Council of Teachers of Mathematics regarding effective, engaging math education for children 3 to 6.

27. **Math goes to the playground.** Early Childhood Today, June-Aug 2003. Instructions for an activity in which children chart and graph the items on their playground.

28. **Math websites.** Compiled by CCIC, 2004. List of Internet websites for interactive math games for children and families. Readers may request to have it emailed for easier accessibility.



29. **More than counting: math activities for preschool and kindergarten.** Sally Moomaw. Early Childhood News, Nov/Dec 1998. Manipulative and board games to channel children's thinking toward math concepts through active play.

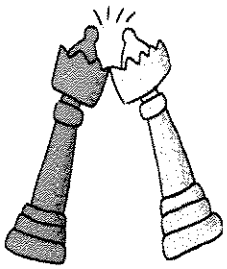
30. **A multitude of math books!** Early Childhood Today, Jan/Feb 2004. Children make their own math books to include in the math center. For mixed ages.

31. **The pizza project: Planning and integrating math standards in project work.** Marilyn Worsley, Sallee Beneke, Judy Harris Helm. Young Children, January 2003. How the project approach integrates math with other activities and other activities with math.

32. **Promoting the construction of early mathematical concepts in children under five.** Eugene Geist. Young Children, July 2001. Although basic math concepts cannot and should not be directly taught to children from birth through four, if adults follow these suggestions about environment and interactions, children's understanding of math will naturally emerge.

33. **Quiltmaking: A perfect project for preschool and primary.** Jeanne Helm and others. Young Children, May 2000. Making a patchwork quilt involves many math skills. This article describes a cross-curricular quilting project, lists classroom activities for both preschool and primary classrooms, and shows how quilts promote home-school connections.

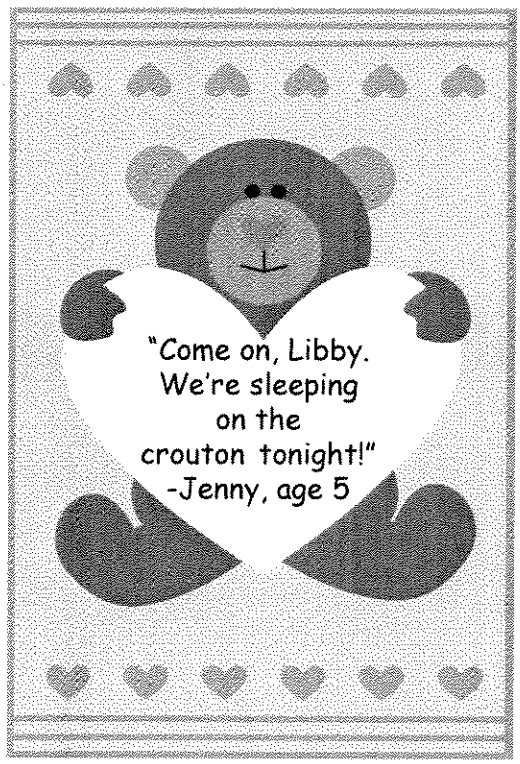
34. **Reading in the math class: Selecting and using picture books for math investigations.** Debra H. Thatcher. Young Children, July 2001. Story books to use and questions to pose to spark children's thinking about math.



35. **Teaching chess to young children.** Deborah Bankauskas. Young Children, July 2000. A teacher's tips for introducing chess to children, developed when her kindergartners insisted on learning the game and playing whenever they could.

36. **Using everyday objects & materials to teach math.** Gretchen Glenny Damon. Early Childhood News, Jan/Feb 2001. Recommends concrete materials, discovery through exploration, questions that spark involvement, and promoting problem-solving. Includes a staff newsletter on math and science activities.

37. **What children's play tells us about teaching mathematics.** Kyoung-Hye Seo. Young Children, January 2003. Math is about thinking, not just doing something with manipulatives. Through close observation, teachers can see mathematical ideas emerging from kindergartners' play. They can then ask good questions to help children reflect on their play and construct more advanced mathematical understanding.



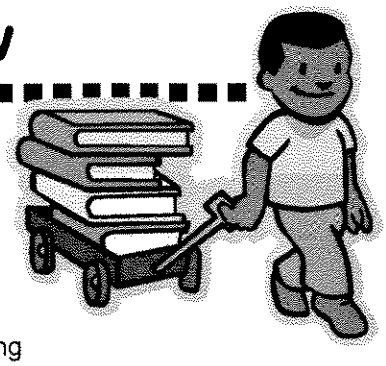
38. **What is a "good guess" anyway? Teaching quantity and measurement estimation.** Frances Kuwahara Lang. Young Children, July 1999. Activities to help children develop the thinking required to make a good guess.

39. **When I listen to music.** Alan Russell James. Young Children, May 2000. Describes the benefits of music. Shows how exposing children to the patterns of different kinds of music helps them to recognize patterns in mathematics.

40. **Where's the math?** Texas Child Care, Summer 2003. Math is in open-ended questions and activities in all areas of the classroom: art center, science and discovery center, blocks, library and writing centers, music and movement, manipulatives, dramatic play, outdoor play, and mealtime.

MANIPULATIVES are pieces. It is a fancy word to describe many pieces of a material that can be handled, moved around, arranged and rearranged, counted and sorted. Examples of manipulatives are beads, small blocks, buttons, corks, paper clips and marbles.

Books-to-Borrow



Annotations by Glenna Carter, CCIC Acquisitions Librarian

Reflecting, Discussing, Exploring Early Childhood Mathematics

41. **The Block book.** 3rd ed. Elisabeth S. Hirsch, editor. Washington, DC: NAEYC, 1996. Classic book on the value of unit blocks in helping children grow as problem solvers and collaborators.

42. **Developing constructivist early childhood curriculum: Practical principles and activities.** Rheta DeVries. New York: Teachers College Press, 2002. How a constructivist learning activity and children's reasoning both change over time as children get more experience playing with a physical phenomenon or participating in a group game.

43. **Engaging young children in mathematics: Standards for early childhood mathematics education.** Mahwah, NJ: Lawrence Erlbaum Associates, 2004. Standards of excellence for teaching math to students in kindergarten through 2nd grade, worked out by a varied group of experts at a 2000 Conference on Standards for Pre-Kindergarten and Kindergarten Mathematics Education.

44. **Helping children learn mathematics.** Washington, DC: National Academy Press, 2002. Concise advice for parents, caregivers, teachers, administrators, and policy makers on what they can do to help all school children become mathematically proficient.

45. **Mathematics in the early years.** Juanita V. Copley, editor. Reston, VA: National Council of Teachers of Mathematics, 1999. Leading scholars discuss how young children discover mathematical ideas and how their teachers ask questions, listen to answers, analyze children's unique thinking, and foster young students' informal mathematical knowledge.

46. **More than numbers: Mathematical thinking in the early years.** Redmond, WA: Child Care Information Exchange, 1996. Collection of articles about math from CCIE.

47. **The young child and mathematics.** Juanita V. Copley. Washington, DC: NAEYC, 2000. 3-year-olds are typically enthusiastic and confident when it comes to exploring math ideas, while 8-year-olds are typically apprehensive and fearful. This book offers lively classroom vignettes and teacher-tested ideas on how to keep the joy of mathematical problem-solving alive in children ages 3-8.

Math Activities for Preschool and Primary Children

48. **1-2-3 math: Pre-math opportunities for working with young children.** Jean Warren. Everett, WA: Warren, 1992. Brief descriptions of 300+ math activities.

49. **50 fun & easy brain-based activities for young learners.** Ellen Booth Church. New York: Scholastic, 2002. Engaging, multi-sensory activities that spark learning and support brain development in preschoolers and kindergartners.

50. **Block play: The complete guide to learning and playing with blocks.** Sharon MacDonald. Beltsville, MD: Gryphon House, 2001. Over 50 activities for the preschool and kindergarten block corner.

51. **Count on math: Activities for small hands and lively minds.** Pam Schiller and Lynne Peterson. Beltsville, MD: Gryphon House, 1997. An easy how-to book with over 450 math activities for 3-7 year olds.

52. **Creating child-centered materials for math and science.** Judith Rothschild Stolberg and Ellen R. Daniels. Washington, DC: Children's Resources International, 1998. Describes low- or no-cost household or outdoor materials to use in nearly 100 activities with children ages 3-6.

53. **Early childhood: Where learning begins: Mathematics: Mathematical activities for parents and their 2- to 5-year-old children.** Carol Sue Fromboluti and Natalie Rinck. Washington, DC: U.S. Dept. of Education, National Institute on Early Childhood Development and Education, 1999. This short book shows parents how to use everyday home activities to challenge their children's minds and get them to enjoy thinking about math.

54. **Enriching early mathematical learning.** Grace Cook. Philadelphia, PA: Open University Press, 1997. Math is a process rather than just a body of knowledge. These 20 creative, open-ended activities will get children ages 5-7 participating in that process.

55. **Everyday discoveries: Amazingly easy science and math using stuff you already have.** Sharon MacDonald. Beltsville, MD: Gryphon House, 1998. At the preschool and early primary level we are not aiming for children's mastery of science and math, but for laying a good foundation. This book offers lots of self-directed activities to use in all learning areas and throughout the year to naturally give children that good foundation.

56. **Family math for young children: Comparing.** Grace Davila Coates and Jean Kerr Stenmark. Berkeley, CA: University of California, 1997. Activities and games adults and children ages 4-8 can do together to make math fun.

57. **Group games in early education: Implications of Piaget's theory.** Constance Kamii and Rheta DeVries. Washington, DC: NAEYC, 1980. What children learn socially and cognitively from traditional group games and how teachers can intervene in ways that foster children's understanding of math.

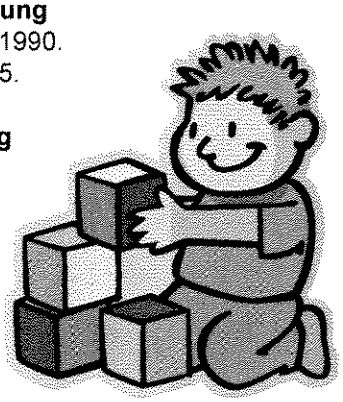
58. **Hands-on math: Manipulative math for young children.** Janet I. Stone. Glenview, IL: Scott, Foresman, 1990. 121 creative, manipulative math experiences for children ages 3-6. Activities combine cooking, art, music, language, science and social skills with math. Includes a section of Parent Notes.

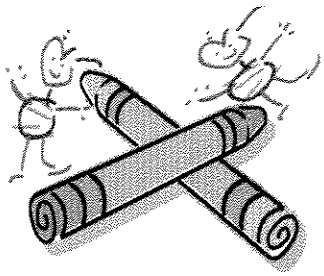
59. **Helping your child learn math.** Patsy F Kanter. Washington, DC: U.S. Dept. of Education, Office of Educational Research and Improvement, 1999. This short book for parents stresses the importance of a positive attitude toward math and offers everyday math activities to do with children in grades K-5.

60. **Learning through play: BLOCKS: A practical guide for teaching young children.** Ellen Booth Church and Karen Miller. New York: Scholastic, 1990. How children grow through block play. Activity plans for children ages 2-5.

61. **Learning through play: MATH: A practical guide for teaching young children.** Sandra Waite-Stupiansky and Nicholas G. Stupiansky. New York: Scholastic, 1992.
Practical ideas for teaching math. Activity plans for children ages 2-5.

62. **Little kids – powerful problem solvers: Math stories from a kindergarten classroom.** Angela Giglio Andrews & Paul R. Trafton. Portsmouth, NH: Heinemann, 2002. Ten inspiring stories, arranged by month of the school year, show how kindergartners grapple with and make sense of math problems.





63. **MathArts: Exploring math through art for 3 to 6 year olds.** MaryAnn F. Kohl and Cindy Gainer. Beltsville, MD: Gryphon House, 1996. Easy, creative art experiences are combined with early math concepts into 200 fun activities that increase the young child's awareness of math through art.

64. **Mathematics their way: An activity-centered mathematics program for early childhood education.** 20th anniversary ed. Mary Baratta-Lorton. Menlo Park, CA: Addison-Wesley, 1995. Classic activity-based math curriculum for kindergarten through 2nd grade.

65. **More than counting: Whole math activities for preschool and kindergarten.** Sally Moomaw and Brenda Hieronymus. St. Paul, MN: Redleaf Press, 1995. Unusual games and fun activities to aid children's construction of mathematical knowledge.

66. **Much more than counting: More math activities for preschool and kindergarten.** Sally Moomaw and Brenda Hieronymus. St. Paul, MN: Redleaf Press, 1999. Over 100 fun activities to encourage mathematical thinking in young children.

67. **Please excuse my dear Aunt Sally: Pre-math activities for story time and take home activities for care-givers and parents.** Judith A. Ecker & Janis D. Berg. DeForest, WI: Cranesbill Publishing, 2004. Lots of activities that work math concepts and skills into preschool story time.

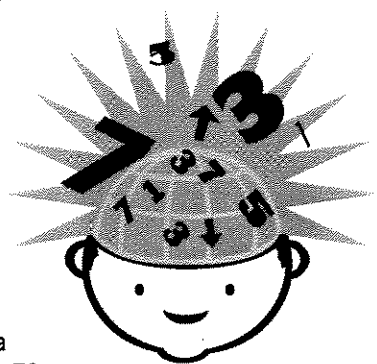
68. **Showcasing mathematics for the young child: Activities for three-, four-, and five-year-olds.** Juanita V. Copley, editor. Reston, VA: National Council of Teachers of Mathematics, 2004. Hanny the Honey Bear discovers the world of mathematics in a big zoo by solving the 35 math puzzles in this book. This well thought out approach will help teachers learn math, teach math, and most importantly "listen to children think."

69. **Workjobs II: Number activities for early childhood.** Mary Baratta-Lorton. Menlo Park, CA: Addison-Wesley, 1979. Instructions for 20 open-ended arithmetic activities with manipulatives for children in kindergarten through 2nd grade.

70. **Young children reinvent arithmetic: Implications of Piaget's theory.** 2nd ed. Constance Kamii. New York: Teachers College Press, 2000. This updated classic translates Piaget's thought into a concrete program of appealing games and activities, a program that has proven much more effective than traditional worksheets, drills, and flashcards in helping first graders think about numbers.

Math Activities for Older Children

71. **The math explorer: Games and activities for middle school youth groups.** Pat Murphy. San Francisco, CA: Exploratorium, 2003. The Exploratorium, a hands-on museum of science, art, and human perception, created these games, puzzles, and experiments to help middle school kids develop math skills while having fun.

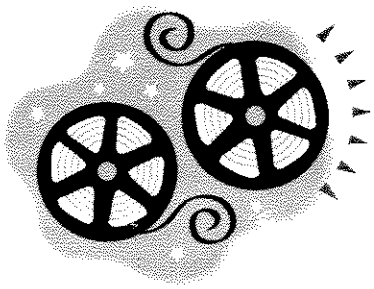


72. **Math for girls and other problem solvers.** Diane Downie. Berkeley, CA: Math/Science Network, Lawrence Hall of Science, University of California, 1981. This book sets unusual problems that require logical and creative thinking from girls ages 7-13. The problems are designed for 90-minute to 2-hour sessions in a recreational setting with the goal of improving both attitudes toward math and problem-solving skills.

73. **Math games & activities from around the world.** Claudia Zaslavsky. Chicago, IL: Chicago Review Press, 1998. More than 70 math games, puzzles, and projects, from all over the world and from various time periods, encourage kids 9 and up to hone their math skills.

Audiovisual Materials-to-Borrow

Annotations by Glenna Carter, CCIC Acquisitions Librarian



74. **Activities for learning math: Numbers, colors, shapes.** State College, PA: Penn State Cooperative Extension, Better Kid Care Program, 2003. VHS, color, 90 min. + guide. This Better Kid Care Satellite workshop for day care center directors and supervisors introduces math concepts and demonstrates play activities through which children can learn numbers, colors, and shapes.

75. **Block play: Constructing realities.** South Carolina Educational Television. Washington, DC: NAEYC, 1993. VHS, color, 20 min. As we watch children happily construct and reconstruct block creations, we see that they are also constructing knowledge and developing skills they need to grow and negotiate their way through more complex learning experiences.

76. **Classification, seriation & number.** High/Scope Educational Research Foundation. Ypsilanti, MI : High/Scope Press, 2002. VHS, color, 52 min. + viewer guide. This program illustrates and describes the 13 math-related High/Scope key experiences grouped under classification, seriation, and number.

77. **Foundations: The value of unit block play.** Rifton, NY: Community Playthings, 2000. VHS, color, 30 min. As they play with blocks, we see children develop mathematical, dramatic, and creative concepts while they learn to share, experiment, create stories, and develop self-esteem. We also see how teachers observe, enhance, and document block play for each child.

THE PATH TO MATH IN EARLY CHILDHOOD EDUCATION. By Rhoda Olenick. Barrington, IL: Magna Systems, Inc., 1996. 5 VHS, color, approx. 30 min. tapes + workbook.
In these programs we see children develop math concepts through everyday play activities in ordinary child care environments. The tapes stress that children develop higher-level thinking skills such as math through their own efforts and their own senses rather than through rote learning.

78. **Tape 1.** **One-to-one correspondence and comparing** (21 min.)
Children match one object to another and find a relationship between two things on the basis of a specific characteristic.

79. **Tape 2.** **Classification and seriation** (31 min.)
Children put things together in one group based on some specific characteristic (classification), and learn to compare more than two items and to put them into order (seriation).

80. **Tape 3.** **Shape and parts and wholes** (28 min.)
Children learn to recognize and name shapes and learn that wholes have parts.

81. **Tape 4.** **Space and measurement** (29 min.)
Children learn relationships in space: direction, position, and distance. They use a formal or informal standard for measuring weight, quantity, length, and volume.

82. **Tape 5.** **Numbers and counting and numerals** (32 min.)
In rote counting, children recite the numeral names in correct order from memory. In rational counting, children attach the numeral names to a specific number of objects. Children learn that each number symbol represents an amount, gradually putting recognition of numerals together with counting.

IDEAS

Button Sorting

Buttons make wonderful manipulatives for older preschoolers and young schoolagers. Be sure to keep them out of reach of infants and toddlers who could choke on them. Collect buttons by snipping them from old garments and garage sale finds. Enhance the collection with novelty buttons purchased at fabric shops or craft departments. Let children sort the buttons by size, color, material type, number of holes, or other criteria they choose. Watch what games and designs they create themselves. Egg cartons and yoghurt cups make good compartments to sort into.

Mouthful of Math

One way to work with math in a real life situation is to bake. Counting spoons or cups and measuring to the correct lines helps children understand math concepts, such as, size, fractions, and addition. Reading recipes is good practice for reading arithmetic problems.

Everyone can enjoy the results when what has been measured, poured, mixed and baked becomes a mouthful of math!

WACKY CAKE

All ingredients are mixed right in an ungreased 9" x 9" cake pan.

Bake for 25 to 30 minutes at 350 degrees.

1-1/2 cups flour
1 cup sugar
1/2 tsp salt
1 tsp soda
3 tbsp cocoa
6 tbsp unsweetened applesauce
1 tbsp apple cider vinegar
1 tsp vanilla
1 cup cold water

Sift all dry ingredients into the pan.
Make a well in the center and pour all the wet ingredients into it. The combination will start to bubble.
Mix well with a fork until smooth.

Playing Restaurant

Children will be easily motivated when you connect dramatic play and food to solving math problems. Before mealtime, let the children assign numbers to the upcoming meal items. They can then collect real money for the different food items served. The prices do not need to be realistic. For instance, a glass of milk can cost 10 cents and a sandwich can cost 2 cents. The age and experience of each child will guide you in how much you develop the play. You might start the youngest children with numbers only and no money designation. Older children may like to actually have dollar ($) and decimal (.) signs included and to write out a menu with corresponding prices listed.

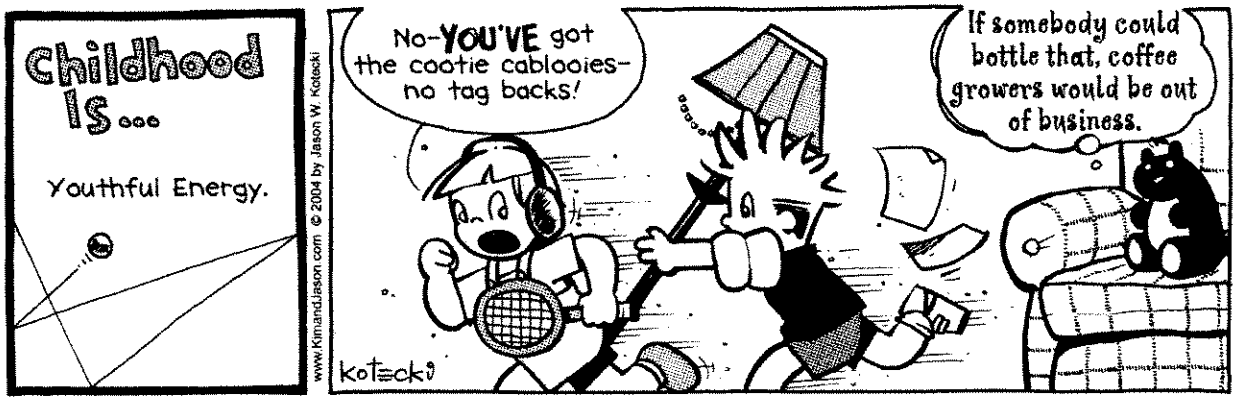
Finger Counting

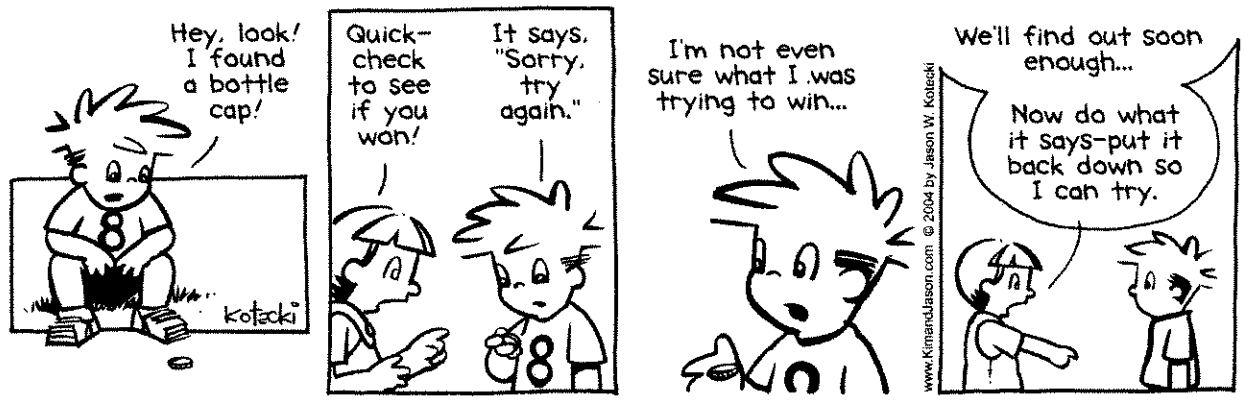
Trace around your hand with a color crayon. Place your hand in a different direction, overlapping the first outline, and trace again in a different color. Do this several more times until the paper is full. Color in the resulting design, using many different colors to fill in the fragmented pattern. Afterward, study the picture to try to find the fingers which have become hidden in the design. Have the children point to each finger that is outlined, counting as they go.

Mystery Maps

Make a series of sums using fanciful descriptions. This is an adaptation of the old favorite "Captain May I?" which requires children to count and add and think sequentially. By following the sequence of instructions, one follows an emerging map. As children figure out the math sums and directions, they get closer to the goal. The map may lead to an actual surprise, but the process of following it is the real fun! A simple math map could look like this:

Start facing the mailbox.
Take 5 steps backward,
turn right,
take 4 + 9 steps forward.
Take two sideways jumps left,
turn right,
take one giant step backwards.
Hop on your left foot 3 times.
Turn around 2 times.
Skip to the tallest tree.
Look under the shiny rock.





Resources Elsewhere

For more instructions for **old-fashioned street games**, such as, marbles and jacks, and games using commonly found materials, go to: http://streetplay.com

Find **more math games** on the Internet at the Family Fun website, www.familyfun.go.com You can download many free learning games for children. Example: Download printable bingo cards for a new game, Math-o. Instead of drawing numbers that match the card, one draws a math equation that the player needs to figure out before knowing whether to place a marker on the card or not. For instance, the card may read "25" under the letter "O". Instead of calling out "O-25", the caller would say, "O, 20 + 5." Available at http://familyfun.go.com/arts-and-crafts/season/feature/famf89school/famf89school9.html

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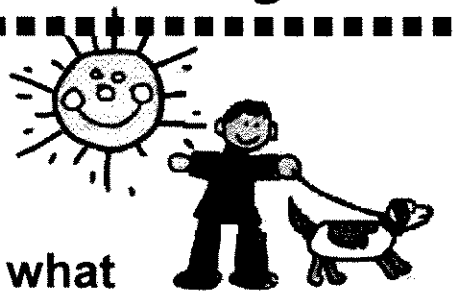

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